Light and Lighting

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Luminous Signs

PERHAPS in no field of applied lighting practice is there more scope for variety than in that concerned with illuminated and self-luminous signs, at any rate with signs used for commercial advertising. From time to time there is controversy about the propriety of such signs in particular localities and, no doubt, opinions differ widely as to the aesthetic value of different signs even when they are confined to sites which are not generally regarded as inappropriate. Luminous signs can be—and some are—vulgar and blatent; but they can be—and many are—attractive in more than one sense of the word. The light-sources available to modern sign designers give them a measure of freedom in composition which, when exercised by those of artistic disposition, has led to some displays which pleasingly adorn our streets by night. The pleasure we get from light and colour is not to be despised when it is accompanied by a message which may not be of interest to us. The message, however, "gets across," as the advertiser hopes it will; enough of us respond to it sooner or later to make luminous sign advertising a rewarding practice.

Notes and News

I.E.S. President 1953-54

Mr. W. R. Stevens takes office as president of the I.E.S. with the opening of the 1953-54 session this month, and will present his presidential address at the opening meeting to be held at the Royal Institution at 6 p.m. on Tuesday, October 13.

Mr. Stevens was educated at Westminster City School and Battersea Polytechnic. After graduating in physics he went to the National Physical Laboratory, where he trained under Dr. J. W. T. Walsh. He joined the staff of the Research Laboratories of the General Electric Company, Ltd., at Wembley, in 1932, where he has now been in charge of the illuminating engineering group for several years. He joined the Society in 1933 and has been a most active member ever since. He has presented a number of papers to the Society in London and in the Centres; he was awarded the Silver Jubilee Commemoration Award in 1936. He has also given a number of papers to the I.E.E. and other bodies.

Mr. W. R. Stevens

Mr. Stevens has served on Council on a number of occasions and has been most active on committees, having served on the Papers, Code and Education Committees; he was also honorary editor of the Transactions of the Society for a number of years. Though he has served, and continues to serve, on many other committees, one of Mr. Stevens's greatest contributions to the work of the Society has probably been in connection with the summer meetings; he was chairman of the exhibition committee for the Convention held in London in 1946, and was chairman of the committees responsible for the three subsequent summer meetings held in the provinces. He has taken a great interest in education in illuminating engineering, and is a member of the City and Guilds Advisory Committee on illuminating engineering; he is also one of the examiners. He is author of the book "Principles of Lighting," which was published recently. In addition to I.E.S. committees he has served on many other committees dealing with lighting matters, including those of the Building Research Board, the Department of Scientific and Industrial Research, the British Standards Institution and the National Illumination Committee.

Our congratulations to Mr. Stevens on becoming I.E.S. president, and our best wishes to him for his year of office, which we are sure will be a happy and successful one. Incidentally it is most appropriate that he should be president during a year which includes a summer meeting.

City and Guilds Examinations

The results of this year's examinations for the City and Guilds certificates

prompted us to compile the following table showing successes in these examinations during the last few years: —

Year	*Intermediate*	*Finals*
1948	98	26
1949	62	48
1950	47	38
1951	50	27
1952	43	26
1953	30	37

The figures as published each year are not perhaps very startling, but it is encouraging to think that over 300 people have passed the intermediate grade during the last six years and that of that number approximately half have carried on their studies to take the final grade. (The total of the above figures for the final includes about 40 to 50 who have taken all sections of the final and whose names therefore appear twice on the list of results.)

The number taking the intermediate in 1948, and perhaps in 1949, was exceptional due to the numbers of young men returning to the industry on release from military service. There is a hint, however, that the number of those taking the examinations is tending to fall; it is also becoming increasingly difficult to arrange courses outside London due to insufficient students being forthcoming. We can only guess at the reasons for this; it may be that the industry is no longer in desperate need of recruits, or it may be that the industry is not attracting recruits. Might we suggest that the I.E.S. gives this its attention.

As Others See Us

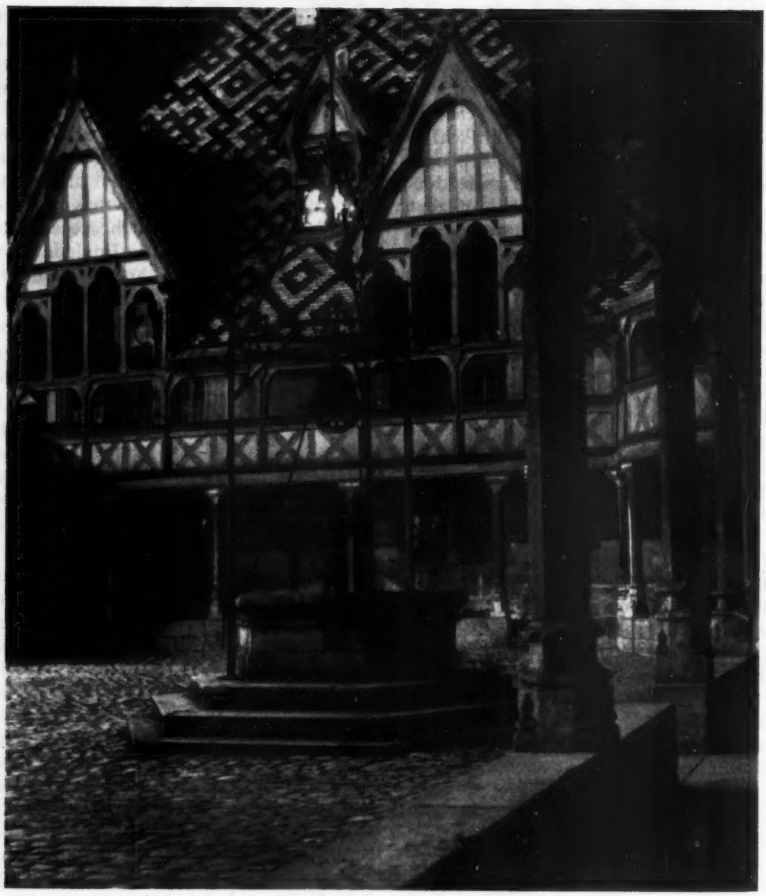
Extract from a recent talk by a Mr. Schrijver on the B.B.C.: "When I go to the Continent I am often asked why I love living in London so much, why I think the English so civilised. I say: 'It is because everybody goes his own way, because nobody tries to interfere, because nobody takes any notice of me. I feel free. I am free. I have time to waste—and,' I add, perhaps a little defiantly, 'I never meet or know or see anybody who really wants to do much work.'

"To me your whole life seems one long concentration on leisure. You have invented an almost unending procession of what I call 'time-wasters,' and I love 'time-wasters.' I don't know about you, but I find it terribly important to waste time and to bolster myself up. I tell myself that nothing is more wasteful than nature, so it must be all right. I love wasting time, wasting money, wasting affection, love, friendship—life itself, I suppose—and so your time-wasters give me endless pleasure, self-assurance. When the whole world has turned its back on open fires and has instead horrible contraptions, which are as ugly as they are efficient, you in England have stuck to your open fires and waste hours playing with them and watching them.

"Like me, you have your passion for watching; watching people play cricket, watching football, watching horses, watching little boats, and best of all watching absolutely nothing. Wherever I go in England I see people seemingly doing nothing except wasting time 'watching,' and enjoying it hugely. For me that is the very height of a civilised society.

"I imagine that all this time-wasting comes from the fact that every Englishman, *au fond,* wants to live like a gentleman, which means—does it not?—that he can do as he chooses and amuse himself in his own time in his own way. The strange thing is that in the quarter of a century that I have lived in London, entire industries have grown up to cope with your passion for leisure and the things you like to do with it. I am thinking of your football coupons and the time it must take to fill these in. There is, of course, your national interest in racing and all the industries that have grown round that. There is greyhound racing, which did not exist when I came here, and, of course, 'listening in,' regular visits to cinemas, and now television, a new time-waster."

So now we know what keeps everyone so busy. But perhaps things are different in the lighting industry.



The courtyard of the Hospice de Beane.

Neon Signs and Displays

By CAPT. C. HIGGINS,
O.B.E., B.Sc., A.C.G.I., M.I.E.E.*

A review of the development and use of luminous discharge tubes for sign and display purposes.

The words "Neon Signs and Displays" are intended as a generic term to embrace the whole range of the luminous discharge tubes used for sign and display purposes in addition to those which are filled with neon gas.

That a luminous discharge, by the passage of an electric current, was possible in a gas was known many years before it was possible to provide sources of electrical energy other than that from purely laboratory machines of the frictional type. The earliest commercial use appears to have been the Cooper-Hewitt mercury arc, which consisted of a tube several feet long with iron electrodes at one end and a mercury electrode at the other end. This had to be tilted in order to start it and did gain a certain application for lighting service.

Its further development, however, appears to have been checked by the introduction of the metal filament vacuum lamp and the gas-filled filament lamp, which provided much simpler sources of illumination without the necessity of special starting devices. This probably delayed the development of the discharge lamp for quite a number of years, although later a further effort was made by an American named Moore to use either nitrogen or carbon dioxide in a tube. The former gas gives a fine warm glow and the latter a cold north light. The characteristic of these base gases in a discharge tube is that the gas cleans up very rapidly, in fact in under two minutes, and it is, therefore, necessary constantly throughout the life of the lamp to feed additional gas.

All these difficulties were overcome and it became possible to make tubes of considerable length which had very long lives. It is interesting to note that the longest tube of this type ever made was 225 ft. long; it required a 6.6 Kv.a. transformer with a potential of 25,000 volts. It was quite innocuous from an electrical safety point of view since the two electrodes and the high tension gear were all enclosed in a safety cabinet.

It is interesting to note that such installations were in use right up to the beginning of the 1939 war, the nitrogen tube for general illumination and the carbon dioxide tube for colour matching purposes, in dye works and similar establishments. The advantage of the carbon dioxide colour-matching tube was that its spectrum remained absolutely constant at all times. The efficiency of these lamps, however, was very low, being of the order of 4 and 2½ lumens per watt respectively. It is not to be wondered, therefore, in view of these promising results, that active search was made in the lamp industry for superior means of providing light.

Towards the end of the last century Ramsey isolated the rare gases in the atmosphere, since when, a period of slightly more than 50 years, all the five rare gases in the atmosphere have been called into the service of man, and they have all been applied to the conversion of electrical energy into visible light. These gases were in the order of their quantity in the atmosphere—argon, neon, helium, krypton and xenon. They all have one characteristic in common, namely that they are all inert, in other words, their chemical activity is nil. They neither combine with one another nor any other element, and except for helium do not occur in terrestrial nature anywhere except in the

* Claudgen Neon Signs.

atmosphere. It is possible to extract helium from monasite sand and also from natural gas which occurs above the oil domes in America and elsewhere.

To give some idea of the occurrence of these gases in the atmosphere, xenon is present one part in 10,000,000. The extraction of these gases from the atmosphere is effected by liquefying the air and fractionally distilling the components, which boil off at different temperatures; they come off with proportions of the base gases, that is, oxygen and nitrogen, from which they can be readily separated.

For the first commercial use of one of these rare gases as a source of illumination for signs, we must turn to Georges Claude, who, in the course of his operations in manufacturing liquid air, had as a by-product a fairly plentiful supply of neon gas. Considerable work was done by this experimenter, and in 1908 he produced his first commercial tube, which consisted of a straight tube about four metres long and about 30 mm. diameter and was employed to light the word "Maxim" on the fascia of the celebrated restaurant of that name in Paris.

As a next step tubes were made into the shape of letters, and thus was started the neon sign business, which has since spread throughout the world.

The tube filled with neon gave an orange-red light, which proved very popular for sign work; however, there soon sprang up a demand for other colours, and the next step was to produce a tube emitting blue light. This was made by using argon gas and mercury; the argon gas alone emits a pale-lavender light of very low efficiency, but the addition of mercury greatly increases the light and improves the colour to a rich blue. By enclosing the blue light in a yellow translucent envelope a green colour could be obtained; in fact, by varying the colour of the yellow glass several shades of green could be obtained.

The palette of the sign-maker was now expanded to three colours, but there was an insistent demand for a white tube. The production of this proved possible by the use of helium gas, which gives an off-white, and which when enclosed in a yellow envelope gives a golden colour. This particular tube, however, possesses certain inherent characteristics which are disadvantageous, namely, it required a considerably higher voltage than the red tube for its operation, which meant more transformers, and hence a greater cost.

In 1933, however, there came another important advance when Claude General Neon Lights, Ltd., introduced the fluorescent tube. In this tube use is made of the ultra-violet light emitted from the discharge; this is, of course, invisible to the human eye, but by the use of certain crystalline materials having fluorescent properties, this short-wave light is converted to longer wave-length and becomes visible. The amount of energy converted into ultra-violet light in a mercury low-pressure tube is considerably greater than the amount converted into visible light, but by the use of efficient fluorescent materials the useful light emitted can be increased as much as ten times. These fluorescent materials occur in a natural state, e.g., Willemite-Zinc Silicate; but the materials occurring naturally are not very efficient and man-made powders are very much superior.

The earliest tubes of this kind were made with fluorescent powders made from sulphides, which permitted the making of tubes of many beautiful shades of colour. In practice, however, it was found that the luminous efficiency of these was not high enough, and in certain other respects they proved unsatisfactory. The research laboratories of the G.E.C. were asked to develop improved powders, and under the aegis of Mr. J. Ryde, F.R.S., in a short time several new colours were made available; this work started a chain of research which has continued uninterruptedly from that day to this with many important discoveries, not the least important of which was the new white powder, halophosphate, which has merits for making fluorescent tubes to give white light suitable for ordinary lighting purposes (as opposed to sign work) far above any yet discovered.

Throughout all this time a great deal of effort was put into the search for a white tube—and if a study of the files of the patent office is made, one will be amazed at the number of futile applications made in this respect.

The first true white was obtained by the use of a complex salt of zinc, which gave an off-white colour; this colour when combined with an amber or a pink tube gave a light which was suited to general illumination. It will thus be seen that the sign tube technique was beginning to encroach on the lighting field. Many installations were made of sub-canopy lighting for cinemas and for other general lighting applications.

It should be emphasised at this stage that it was this early work which showed the way for the production of the now common mains voltage fluorescent lamp. It was also discovered that the neon tube

emitted ultra-violet light, and when used with zinc silicate, which with mercury emitted a green light, gave an amber light, and when used with calcium tungstate, which with mercury emitted blue light, gave a pink light.

Many large installations of high voltage fluorescent lamps were made before the war, a great number of which continue in use to this day; they are still in constant demand and the new white powders have emphasised their value. For the most part these installations were equipped with tubes having cold cathodes, but some were made with hot cathodes.

Nearly all sign tubes are made with cold cathodes, and it seems as well at this stage that the terms cold and hot cathodes should be explained.

The cold cathode usually consists of an open-ended cylinder of iron of a size sufficient to ensure that in operation its temperature does not rise above 200 deg. C. But in order to get the electrons out of this material it is necessary to use a greater quantity of energy than would be necessary if the electrode were coated with some material which easily emits electrons. Thus the wattage consumed at the electrode is greater with a cold cathode than with a hot one; the voltage drop over the cathode being of the order of 200 volts in the former as compared with about 20 volts in the latter.

In the hot cathode, of which there are various forms, the temperature must be raised to at least 800 deg. C. But actually, owing to the high cathode fall with cold cathodes and the low fall with hot cathodes, the watts lost in the former are much higher than in the latter, hence the cold cathode is hotter than the hot cathode.

The disadvantage of the hot cathode is that the emissive material is gradually dissipated until none at all is left, when the cathode behaves as a cold cathode and is, owing to its small size, rapidly disintegrated; hence we have an advantage in duration of life of the cold cathode over the hot cathode.

The disadvantage of the cold cathode is that it requires more volts than the hot—a serious matter in the case of mains operated lamps, but not of much importance in signs where we have plenty of volts available from the use of step-up transformers.

A neon sign consists of three essential elements, viz.:—

i. The tubes.
ii. The transformers and wiring.
iii. The background.

Item i has already been discussed.

The Transformers and Wiring

The characteristic of the discharge tube is such that two essentials are necessary to initiate and maintain the discharge, viz.:—

(a) That the voltage available for initiating the discharge shall be nearly twice that required to keep it running.
(b) The current shall be prevented from rising above a predetermined value, owing to the negative characteristic of the tube.

These two requirements can be met in a number of ways. First a low reactance transformer can be used with resistances in series with the tubes. The objection to this method is that the resistances, if they are to be satisfactorily protected against deterioration due to weather, become rather costly.

Second—instead of the resistances, a choke in series with each tube circuit which are themselves unparallel.

Third—a modification of the second with a series choke and the tubes all in series.

Fourth—a primary choke with the tubes in series on the secondary.

All the above methods are now obsolete

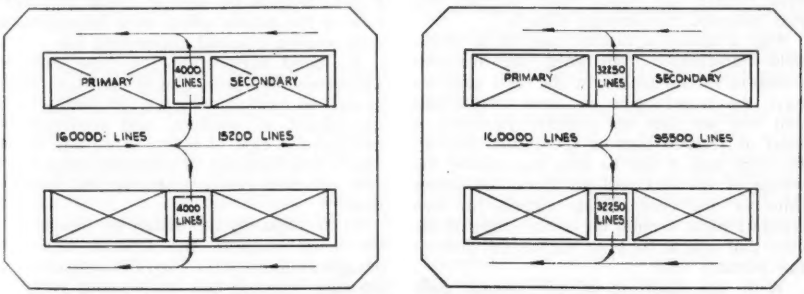


Fig. 1 Stray-field transformer; (left) secondary open circuited, (right) secondary loaded.

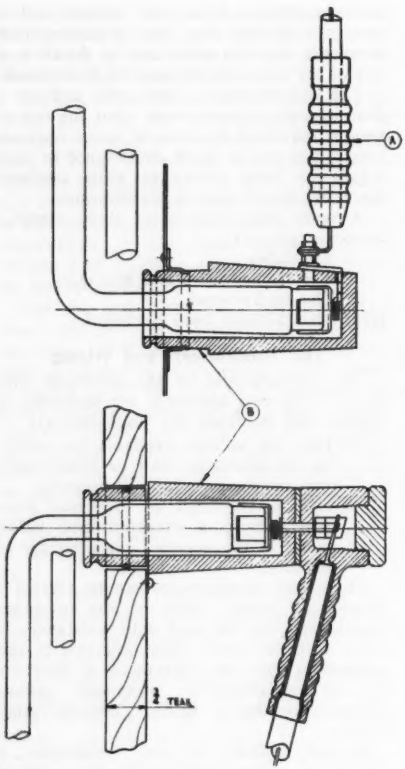


Fig. 2. Showing (A) ozone-proof cover to protect end of cable, (B) electrode housing.

as they have been replaced by the stray-field transformer, which was, for this use, first patented by Georges Claude.

Fig. 1 shows a typical case of a stray-field transformer, illustrating the flux distribution in the core. In the first case we have the transformer on open circuit and you will see that the primary produced a total of 160,000 lines in the centre limb of the core, and it will be seen that almost the whole of the flux will go along the centre limb of the core, divide equally in two separate parts around the outer limbs of the core and return back to the centre limb at the primary coil.

With the insertion of the leakage path between the primary and secondary coils some flux is by-passed and returns to the main core by the shorter route. Now, since the secondary voltage depends directly upon the flux embracing the coil and turns ratio, it will be seen that on open circuit the secondary voltage will be for all intents and purposes directly proportional to the turns ratio, since there is very little flux loss between the primary and the secondary. However, with the transformer on load, and if we refer to the second illustration, it will be seen that a much higher proportion of the main flux emanating from the primary portion of the limb is now by-passed through the shunts, and only some 50-60 per cent. of the total flux embraces the secondary coil. Consequently the secondary voltage must drop to some 50 or 60 per cent. of its open circuit voltage, and so we arrive at the ideal conditions for operating a discharge tube device, namely, a high initial voltage to strike the tube, falling instantly to a stable condition at about 50 per cent. of this value.

The quality of cable to be used is specified in B.S.S. 559, and the method of installation in I.E.E. Wiring Regulations. The voltage of transformers is now limited in the new Wiring Regulations to 5,000 above earth, which voltage all cable must be designed to withstand indefinitely.

Now the discharge tube circuit has at these voltages a bad habit of generating ozone, and since vulcanised india rubber deteriorates very rapidly under the influence of ozone, it is necessary to protect the vulcanised rubber by means of an ozone-proof cover, and further, when installing a cable, it is essential to protect the cut end where the vulcanised rubber is exposed by some ozone-proof substance. In 1931 the author designed a simple means of doing this, which is illustrated in Fig. 2 (a).

Design of Signs

At this stage consideration must be given to the design of the sign, in which consideration of the artistic effect must be combined with making a sound engineering job.

A sound engineering job must embrace well-established principles of electrical safety as well as mechanical safety, immunity from the effects of weather, and provision of facilities for ease of maintenance and cleaning. Considerations of economy insist upon ease of construction, assembly and installation.

So in preparing the design for a sign, first the artist prepares his scheme, then the draughtsman prepares from this a small-scale drawing showing how the various parts fit together and how they are to be applied to the building for which the building facade

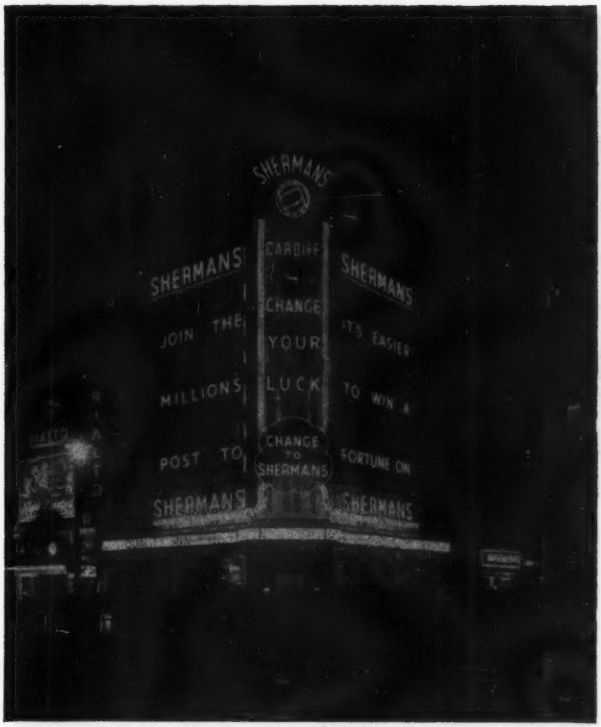


Fig. 3. Example of teak letters on rails.

has been surveyed in conjunction with the artist's scheme.

Finally the draughtsman gets out full-size drawings of tubes and lettering to allow the various craftsmen to make the glass and the metal letters or other background of the sign, such as a sign painted panel. These drawings show also the method of fixing to the building.

Let us then consider the various steps. Since we are using high voltages steps must be taken to ensure that all parts of the sign are safe, or that they can be made safe for maintenance men and cleaners to work on.

The Regulations for the Electrical Equipment Buildings (section 8) set forth the safety requirements of the installation, and the British Standard Specification No. 559 deals with the integral parts of the sign. In the latter, one finds the specification for the transformers, cables, and the electrical side generally, as well as various mechanical limits for supports, letters, and panels. In the former are given the requirements for the installation of discharge lamps or tubes.

If these two are rigidly adhered to, then a perfectly safe sign will be made, safe as to electrical security and safe as regards fire. Of course, rigidly to adhere to these rules costs more than to ignore them, and it is regrettable that they are not mandatory, since the adherence to them by reputable manufacturers means that the price asked is higher than that asked by a cheap-jack maker, who ignores all considerations of safety.

Signs cannot be standardised—by the very nature of their purpose they must be varied in design. In the interests of economical construction, therefore, as many component parts as possible must be standardised, and it has been found essential to design various component parts which can be easily assembled, and which can ensure safety in the use of the high voltages.

Electrode housings (Fig. 2 (b)) are made of porcelain or glass and their purpose is to

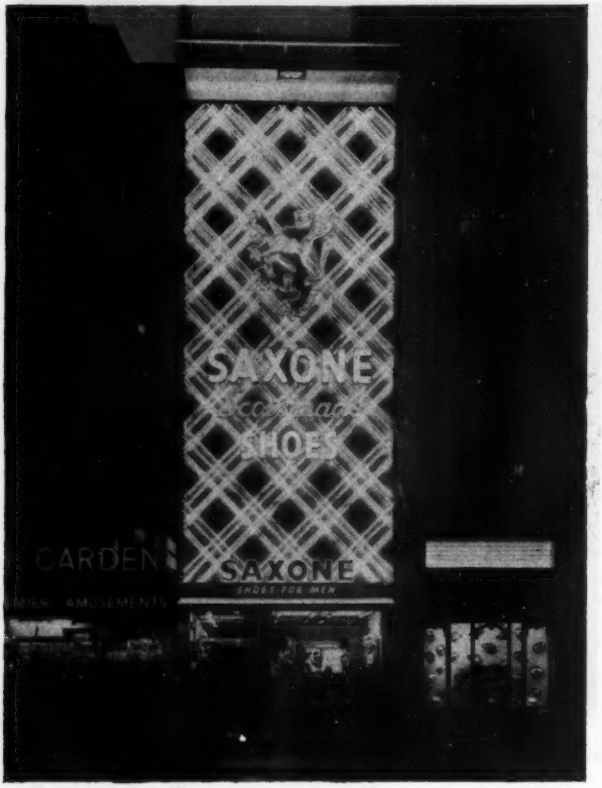


Fig. 4. *Example of use of stepped-edge letters.*

prevent tracking from the glass surface of the tube to the earthed background. This is most necessary because if tracking does take place near an electrode it is quite possible for the glass to be punctured and it is possible under certain conditions for an arc to be set up which might cause a fire. The use of the porcelain housing reduces this possibility to vanishing point.

The mouth of the housing is sealed with a cork ring which is varnished; this prevents the access of snow, water, or insects into the interior of the housing.

In certain conditions, such as the outlining of buildings, it is permissible to use bell glasses to cover and protect the electrodes. This is quite satisfactory and besides being cheaper than providing metallic electrode boxes, such as are generally necessary in interior work, is not unsightly. Bell glasses are also used to protect the cable end terminal already described; they have the advantage that they prevent soot from being deposited on the insulator.

For two reasons it is desirable to prevent the tube coming into contact with earthed bodies, and so an insulated support is essential. The first reason is to prevent the wall of the tube being punctured by the discharge. The second is that with tubes containing mercury, as an earth tube support is also a good conductor of heat, there is a tendency for mercury to condense inside the tube around such an earthed support giving a patchy appearance to the tube. Two forms of supports have been designed, (a) glass or porcelain angle bracket with phosphor bronze clip, (b) moulded glass or porcelain hook. The former is adjustable and can thus be used to take up inaccuracies in the glass tube; the latter is not adjustable

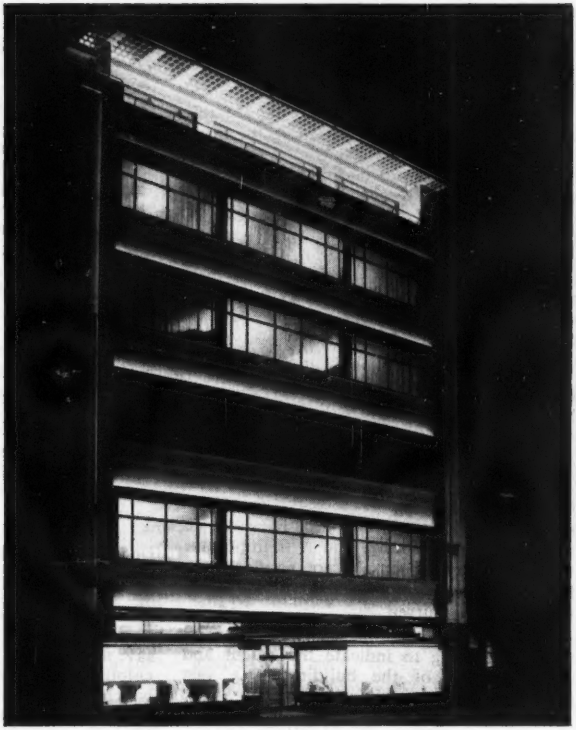


Fig. 5. Showing use of luminous tubes in conjunction with the architectural features of a building.

and is used for a more exact class of tube work which is described later.

There are, of course, many other standardised parts which go to the building of a sign, but those described will serve to show the principle of using standardised components in the building of signs which from their very nature cannot readily be standardised.

Name Signs

The simplest form of name sign is the panel upon which is painted the required legend, with the tubes superimposed thereon. It will be appreciated that the turnbacks of the tubes tend to blurr the distinctiveness of the sign when viewed from an angle. This is really a detraction only when the letters are small, say up to 15 inch, and hence it is inadvisable to use superimposed tubes for fascia signs when the height of the fascia is low (below 15 ft.) and when the sign is intended to be legible from an angle, as when one is approaching the shop from along the street on the same side. It is suitable for greater heights and larger sizes of letter and for those cases where the sign is intended to be read from the front some distance away. The simple sign painted panel can be improved by having wooden letters $\frac{1}{4}$-inch thick mounted on the panel. A simple but effective example of teak letters on rails is shown in Fig. 3.

For the lower fascia heights, it is desirable to go in for a stencil cut panel, with the tubes semi-recessed so that none of the turnbacks is visible, or better still for a metal letter, with the stencil cut for receiving the semi-recessed tubes. Either of these devices makes for a much more legible sign when read at an angle.

A further method of ensuring legibility and producing a dignified sign is the stepped edge letter (Fig. 4). This, whilst possessing the advantages regarding angular legibility of the recessed letter sign, also has the advantage that the centre of the face of the

letter is unilluminated, but surrounded by tube so that the letters stand out very distinctively without ill-effect by halation from neighbouring letters.

There are other less expensive methods of effecting nearly the same result, but the daylight appearance is not so good; the open trough letter is one of these. In this case the tube is located just below the front edge of the trough. In some cases the front edge of the trough is turned a little so as to produce something of the effect of a stencil-cut letter. Both these methods, although inexpensive, have the disadvantage that they are not very easy to keep clean, a very important consideration in our large, smoky cities.

Outlining

Outlining can take the form of a simple border to a name sign, or the outlining of the architectural features of a building (Fig. 5).

In the former case care must be taken in colour selection to ensure that the colour of the name sign does not clash with the colour of the outlining, and it is important that the outlining should not so flood the face of the sign that the clarity of the name sign becomes blurred.

In the latter case much can be done by simple outlining to indicate the height and overall length of the building to a vast display. The Saxone shop in Coventry Street is an example of a display mounted on a perfectly plain façade.

The daylight or unilluminated appearance of the sign is important and must be considered with just as much care as the night-time or illuminated appearance. When the sign consists of letters only, or of letters only with a small amount of border or outline work, it is generally desirable that the colour scheme by day should be as close as possible to the colour scheme by night. This is especially important when the colour scheme is that of an established trade-mark.

Hence consideration must be given to the painted colour of the sign; in general it may be taken that the face of the letter should be of a different colour from the returns, and when this arrangement is used it is best to have the faces in a lighter colour than the returns, e.g., a gilded face, and red returns, or a red face and black returns. This tends to throw up the sign more effectively than when only one colour is used. Similarly consideration must be given to the background colour. If the letters are mounted on a panel then the colour to be selected for the panel should be such as to enhance the effect of the letters, e.g., gilded letters on a green panel. It is best in England, where there is so much soot in the atmosphere, to use fairly heavily pigmented colours, such as green, blue, black, rather than light colours such as cream or white, since the latter require so much cleaning to prevent them becoming shabby, although if the sign is regularly cleaned a cream background is very attractive.

If the letters are mounted on rails on, say, a red brick wall, then obviously some colour should be used for the letter faces which will contrast with the red of the brick. It is very important to avoid clashing colour in signs just as it is in any decorative work. One further word about letters mounted on rails:—the rails can either be painted so as to merge in with the background or in some other colour so as to contrast with

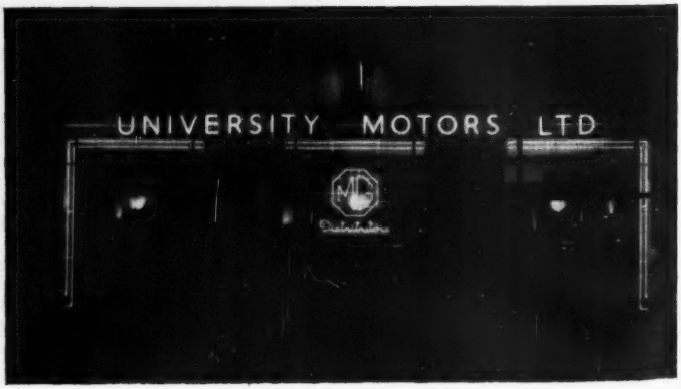


Fig. 6. Example of fascia sign.

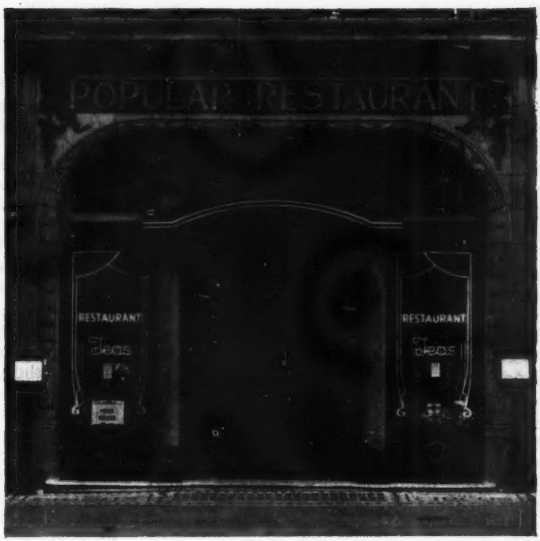


Fig. 7. Showing use of luminous tubes as a "window trim."

the background and thus form a part of the design.

This aspect of sign design has been touched on only lightly because it is a subject worthy of an article all to itself, but the importance of colour as effected by the illumination makes it necessary to make this discursion. For it must be remembered that the colour of light emitted from the tube affects the colour of the letter faces by night; thus a dark green tube on a red background will turn the red of the background to jet black, just as a red tube on a deep green background will alter the colour to a blue-black.

Discrimination must therefore be used in making the selection of paint colour, and the colour of the light emitted from the tube.

Legibility of Illuminated Signs

The legibility of illuminated signs is an important aspect of sign design. The shape of the letter has considerable bearing on this, the best and most easily legible letter is the plain block letter, proportioned so that the width of the letter is about two-thirds that of its height for a letter H, with other letters in proportion. The spacing of the letters is also vital, since if they are overcrowded the legibility is diminished owing to the halation effect of one letter upon its neighbours; a similar poor result will be obtained if the width of the letter is small in relation to its height.

The general considerations affecting legibility are :—

(i) Distance at which the sign is to be effective,
(ii) Shape of the letters,
(iii) Spacing of the letters.
(iv) Intensity of the light emitted from the tubes,
(v) Colour of the light.
(vi) Height of the letters.

With 11/12 m.m. tube on a white background the distance at which a 12-in. letter can be read is :—

in red—525 feet;
in blue—395 feet;
in green—340 feet.

This is in a clear non-smoky atmosphere. In England as a rule the legibility of the blue and green is reversed and considerably diminished.

For very long distances, an easy rule is 9 ft. height for one mile, and *pro rata* for other distances. The luminous intensity of the tube should be about 35 to 40 lumens per foot run in red.

Signs of this nature, intended for very distant legibility, are, however, rare, as owing to their great size they are necessarily costly, the cost of background frame work rising appreciably with increased height, and

the steel work becomes at times a considerable structure.

The sign which must be given great care is the fascia sign (Fig. 6). This is erected at a comparatively low height, generally not exceeding 20 feet, and should have advertising value when viewed from an angle as well as when viewed from the front, and when viewed by day unilluminated as well as when illuminated at night. This then calls for either a semi-recessed tube, or, as it is called, stencil cut letters, or a stepped edge letter sign. With either of these designs the intensity can be stepped up quite a lot without seriously affecting the legibility of the sign, but in any case remember that the fascia sign is seldom required to be read from remote distances.

Intensities as high as 240 lm./ft. run for signs of this class have been used especially for cinema facades where it is the intention to have a considerable splash of light on the face of the building, and hence on the pavement in front of the building.

With small box signs of the type which extend over the footpath, the size is necessarily limited by regulation in this country, and as most customers want a good deal of legend on the sign the letters are small. This is a class of sign which for the best results requires a stencil-cut panel, with the tubes semi-recessed. The intensity should always be kept fairly low, not exceeding about 33 lm./ft. or even lower, otherwise the halation effect will tend to render the sign illegible at even quite short distances.

Into the same category, as regards intensity, falls the shop window sign; an added caution here is that the colour should be either blue or one of the soft "Cleora" range of fluorescent colours.

Before leaving the subject of fascia, it is as well to remind readers that the light from the signs necessarily falls on the faces of those looking in at the shop windows, and that one should therefore seek to choose a colour or combination of colours which will produce a flattering effect on the human face. It is difficult for a woman to get enthusiastic about some article of merchandise displayed under perfect lighting *within* a shop window, when the colour of her own face and those about her suggest a deathly hue, such, for example, as is produced by green light. This does not rule out green as a colour for the fascia sign, but it must be blended with some other colour by way of a border or surround of amber or pink, so that the combination gives a resultant hue which will give a pleasing effect on the human face.

Window Signs

Whilst window signs are housed indoors, they are viewed from outside and may therefore be considered in our review of outdoor illumination. There are several varieties of window signs; the plate glass panel with tubing superimposed, is a good example. A more elaborate type is the decorated metal box sign with a stencil cut front panel illuminated from behind with rows of tubing; by the use of lenticular glass a very uniform illumination of the panel can be obtained.

Another type of window sign is the "window trim." This has not met with as much enthusiasm in this country as it has in the United States, but it is an attractive arrangement. It is not suited to the class of shop which requires a high intensity of illumination for its window displays, as in dress shops, but Fig. 7 shows an example of a dignified window-trim. The same remarks regarding colour selection apply to these window signs as applies to the fascia sign.

In outdoor displays consideration must always be given to the influence which different kinds of street-lighting will have upon the effect of the sign or display. There are now no fewer than five different kinds of street-lighting which may be encountered, viz.:—gas, tungsten, fluorescent, sodium and high pressure mercury discharge lamps. The first three have little or no influence and may therefore be disregarded, but with sodium and high-pressure mercury discharge lamps, quite serious distortion of colour may occur, and display schemes should be so designed as to take account of this factor, and avoid unsatisfactory results.

In the case of new buildings, too much emphasis cannot be placed on the desirability of close co-operation between the architect and the sign designer at a very early stage in the preparation of the designs. In those cases where this co-operation is achieved material benefit always accrues; the sign instead of appearing as an after-thought becomes a part of the general concept of the architectural design. Fig. 8 (Simpson's, Piccadilly) shows an example of this.

A good deal has been said about the influence of colour in display work; personal taste is so important that hard and fast rules cannot be laid down. One can only indicate those conditions which should be avoided and which are independent of questions of taste.

Association Française des Eclairagistes

An account of the recent meeting of the A.F.E. held in Dijon.

The annual meeting of the Association Française des Eclairagistes, which was so successfully held in Toulouse in 1952, was followed by an equally successful occasion held at Dijon from May 9 to 17 last. It was attended by about 150 lighting engineers and their ladies, including visitors from Belgium, the Netherlands, Germany, Spain, Switzerland, Italy, Great Britain and the United States. It was unfortunate that the date of the meeting, which was fixed so that Dr. Ward Harrison, the president of the C.I.E., could attend, clashed with the annual general meeting and annual dinner of the I.E.S., so that several members who would have otherwise represented this country were not able to attend. The British participants were Mr. and Mrs. H. G. Jenkins, Mr. and Mrs. A. H. McKeag, and Mr. J. M. Waldram.

An account of the meeting at Dijon must begin with a mention of the train journey from Paris, on the newly electrified Paris-Lyon line by the "Mistral," hauled by one of the new electric locomotives, which must be the pride of the French railway engineers. Even to a fairly hardened traveller, it was an experience to run smoothly up to 85 m.p.h. and to keep it up steadily and unchecked for mile after mile, without any uncomfortable vibration even in the dining car.

Dijon, like Toulouse, is an ancient city with a long and interesting history; it is the former capital of Burgundy, the seat of the Dukes of Burgundy, whose magnificent palace now forms the Town Hall. It was in the Great Hall of this palace that the meetings of the A.F.E. took place. The city is, however, different from Toulouse; smaller, cleaner, less florid and more compact, a place of narrow streets and interesting buildings, some of which it would have been easy to overlook had they not been most effectively floodlighted. The centre of the city, with the Palais des Ducs facing the semicircle of the Place de la Liberation, the theatre nearby and the church of Saint-Michel made an unforgettable scene, particularly at night. The association is specially to be congratulated on the floodlighting. In Dijon 60 buildings, and in Beaune 30, with many chateaux on the famous Route des Vins between the two towns, were lighted with taste and distinction by a number of lighting firms. Not only this, but more than 150 street lanterns were erected on columns and brackets in 23 streets and squares in 32 demonstration installations. A Salon de la Lumière was arranged in an unusual setting — the Archaeological Museum, which is the ancient Church of St. Philibert, a building now deconsecrated, but never able to forget its ecclesiastical heritage. The salon was on a much smaller scale than at Toulouse, but the indoor exhibition was well compensated by the outdoor lighting.

The proceedings began on May 11 with a reception in the evening at the Cellier de Clairvaux, an ancient wine-cellar, where delegates gathered, met old friends from many countries, heard a couple of informal speeches of welcome, and were reminded for the first of many times that Dijon is the capital of Burgundy and that Burgundy is a wine-growing district. Dijon, it appears, is famous for three other products as well: mustard, "pain d'épices," and "cassis"—a berry used for making a formidable liqueur. The ladies, for whom a special programme

was arranged, were able to see the making of all three, among other delights.

On Tuesday there was the formal opening of the Conference in the presence of the Préfet of the Côte-d'or, and the Deputy-Maire of Dijon, M. le Chanoine Kir. This was followed by the first working session, under the chairmanship of Dr. Ward Harrison, when Prof. Fleury, President of the French National Committee, spoke of the international aspects of the evolution of lighting technique, referring particularly to the work of distinguished Frenchmen.

At noon the members proceeded to the ancient kitchen of the Palace (the scale of which gave a faint idea of the magnificence of its provisions at the height of its glory) where M. le Deputé-Maire welcomed them with a *vin d'honneur*, in a long and most eloquent speech, impossible to reproduce, in which among other matters he used the techniques of lighting as an analogy of the greater problems of promoting international goodwill, and then took the opportunity to chaff the local administrative officials. The afternoon was devoted to light sources; first Prof. Destriau, speaking on the phenomena of electroluminescence, of which he is the discoverer. The principle is simple; certain specially treated substances have the property of emitting light under the action of a changing electric field. To make an "electroluminescent condenser" it is necessary only to incorporate the sensitive substance in the dielectric of a very thin capacitor, one of the electrodes of which is transparent, for example glass, the surface of which is made electrically conducting by hot treatment with the vapours of tin and antimony chlorides. The second electrode can conveniently be of a deposit of aluminium. To obtain an intense field, very thin dielectric layers must be produced of the order of 0.03-04 mm.; the thinner the dielectric, the more intense the field and the greater the brightness. Among the sensitive substances are the sulphides of zinc and cadmium, oxides and silicates of zinc, sulpho-selenides of zinc specially treated; most fluorescent and phosphorescent substances hitherto prepared have little or no sensitivity. The effect seems to be due to a genuine excitation by the electric field and not to secondary emission. The brightness is increased by increasing the field and increasing the frequency. At present brightnesses of 60 ft.-lamberts can be achieved, but the efficiency is low, 6-8 lm./w. Life appears to be very long.

This paper was followed by one from Britain and one from the United States. Mr. H. G. Jenkins and Mr. A. H. McKeag read a paper on "Fluorescent High-Pressure Mercury Vapour Lamps." They recorded the progress made recently in the production of improved lamps, giving the theoretical basis and the possibilities of correction particularly in the red end of the spectrum. The characteristics of the more important fluorescent materials were given, and the factors influencing the design of lamps were discussed, such as the fluorescent coating, the gas-filling of the outer bulb and its dimensions. The authors discussed the photometric and colorimetric results and finally illuminated the lecture theatre with two lamps, to the evident approval of the audience.

Mr. Eugene Beggs, of the Westinghouse Electric Corporation, spoke of the tendencies of the American industry in discharge lamps. More than half the light produced in America to-day emanates from fluorescent lamps; the 4,500 deg. K lamp is favoured; there is an increase in the use of the "De Luxe" colours with improved colour rendering. Another interesting tendency is towards the increased use of the 96-in. slimline lamps and the Rapid Start ballast. Mr. Beggs devoted much of his paper to a description of the American high-pressure mercury vapour fluorescent lamp, and concluded with a series of photographs of American lighting installations.

In the evening there was a conducted tour of the floodlighted buildings of Dijon, with explanations by Prof. France and M. Gremaud, Conservateur of Old Dijon.

Wednesday morning was devoted to further papers on light sources. Prof. Servigne, director of research at the National Centre for Scientific Research, discussed the luminescence of solids in a long and erudite discourse. He traced several approaches to the subject, first drawing upon mineralogy and upon the necessarily empirical work of the luminescence chemist, secondly, the work of the atomic physicists on the theory of the solid state, going back to fundamental wave mechanics. He demonstrated the ways in which many different data and approaches had combined to form our present knowledge, and outlined a theory which applies to recent solids with several activators.

From these fundamental considerations we turned to the very practical subject of Standardisation: its principles and their

application to fluorescent lamps, discussed by M. Jean Ayral. Although standardisation was not favoured by some distributors, because it checked their arguments against competition, and by some manufacturers because it required them to maintain a high standard, nevertheless it had the advantages of reducing price and maintaining for manufacturers a restricted series of products designed for efficient manufacture. He defined a standardiser as "an expert in the service of the users, whose mission is to establish, for a certain category of products, a detailed range of some of them which shall give the greatest satisfaction to all the users over the whole range of normal needs." He discussed the difficult point of deciding the moment when standards should be established, and the steps in the setting up of a standard, including a discussion of the kind of characteristics which should be standardised and the limits which should be placed on them, and the scheme of testing for compliance with the specification. As an example, he discussed the possibility of standardising the colours of fluorescent lamps.

The afternoon was devoted to "Light and Life," with two papers by Dr. Dognon and M. Joseph Janin. Dr Dognon, speaking of "Light and Animal Life," reviewed the physiological effects of radiation, visible and otherwise. He referred to the effect of phototropism; to the effects of ultraviolet radiation which is lethal to some forms of life and is therefore used for sterilisation, and which can also result in mutations in some cells, and in cutaneous erythema. Radiation of about 2,900 A can form ergosterol, the antirachitic vitamin, in the skin; this is the basis of sun treatment. Other biological effects were discused. M. Janin dicussed the Photochemical and Biological Applications of Mercury Vapour Lamps. For biological work there are two forms of lamp, the low-pressure germicidal lamp with an envelope of Pyrex or Vicor glass which transmits radiation at 2,537 A, and absorbs that at 1,850 A so that ozone is not formed. For medical work, lamps running at about 1 atm. pressure are used in a quartz or hard glass bulb which absorbs all radiation of wavelength less than 2,600 A. For photochemical work lamps rated at several kilowatts have been produced, running at about 1 atm. in quartz envelopes, for the production of certain chemicals, for example, the insecticide gammexane and other interesting substances. Photochemical lamps are also widely used in photocopying and photomechanical reproduction.

The evening of Wednesday was the climax of an excellent programme of entertainment. Delegates dined in state at the Château du Clos du Vougeot, with the Brotherhood of the Chevaliers du Tastevin, an occasion shared with the Third Photo-Ciné Rally of Burgundy. At the Château, one of the great centres of the wine industry, were displayed their ancient implements, including the great wine-presses with wooden levers 20 ft. long and four ft. square at the fulcrum, surely the most vast examples of rustic mechanism ever built. The visitors were welcomed with hunting-horns to a great barn where a sumptuous meal was prepared; the various dishes were carried in procession, welcomed by witty speeches from the Chevaliers, and accompanied by songs sung by a party of cellarmen, also by some seven excellent vintages. The climax of the evening was, however, the ceremony of initiation to the Confrèrie. The Members of the Order, suitably heralded, and robed in scarlet and gold, took the stage; and after speeches in Latin and French a list was read of persons held worthy to be admitted as Chevaliers, starting with M. André Claude, Dr. Ward Harrison and, eventually and to much merriment, your correspondent, who had spent the evening trying with dwindling success to remain a teetotaller. Dr. Ward Harrison had to drink, on behalf of the rest of us, a large silver bowl of wine, which he did, and to the lasting glory of America remained strictly perpendicular thereafter. The new Chevaliers were kissed on both cheeks, received the accolade from a sprig of vine, and were invested with a "tastevin" on a silk ribbon.

The following day was a national holiday. Your correspondent spent the morning in Lyon in the company of M. Olivier, inspecting the lighting of the Croix Rousse Tunnel, with its entrance portals lit with solid banks of fluorescent lamps. The lighting, ventilation and control system were most interesting and well worth the long drive to Lyon the night before, finishing at 3 a.m. In the afternoon the Congress visited Beaune, to see the many interesting buildings, the Museum of Wines, and the Hotel-Dieu—a large hospital founded in 1443 and in use ever since. Its special glory is the roof of decorated tiles, a feature common in the district but nowhere else so perfected. By night, when floodlighted, it was even more impressive. Dinner was taken in a vast cellar in the Bastions of the Hospice, by candlelight, and again we were entertained by the singing of cellarmen. We returned past the floodlighted Châteaux of the Route des Vins.

The following morning was also devoted

to Light and Life. There were two papers of great interest: Prof. Yves le Grand, on "Light and Animal Vision," described the many forms of eye in various living creatures, from the very simple receptors of the lower organisms to the multiple eyes of insects and the astonishingly precise eyes of birds and of man, including one, new to most illuminating engineers, which anticipated television by having a lens to form an image and a single receptor which is caused to scan the image, being mounted at the end of a long oscillating fibre. The eyes of mammals are generally similar, but are developed either for vision in feeble light or for the perception of fine detail. The human eye with its double receptor system combines both. He discussed the photochemical substances responsible for the perception of light: visual purple, known for a century and found in the human rods, and the yet unknown substances which activate the cones.

Dr. Kellerssohn took up the story and traced the visual process from the eye, through the complex of nerve centres and finally to the brain, showing how it was now possible to identify the regions of the brain which corresponded with various parts of the visual field. It had been found that the area of brain associated with the fovea in man was very much larger than the area allocated to the peripheral regions, a fact which doubtless bears on many of the features of visual performance which are difficult to explain.

In the afternoon Light and Art was discussed. M. Fargette traced the evolution of the luminaire from its origin to the present day; M. Vigneau discussed Art and Light in Photographic, Cinema and Television Studios, and demonstrated an ingenious controller for a three-colour system, in which a knob can be moved about in a kind of colour-triangle, the resulting lighting varying its colour accordingly. Mr. Waldram, in discussion, showed lantern slides of a church in England which demonstrated the use of techniques of directional lighting usually associated with the studio. M. Rivière discussed Light and Works of Art.

There was a formal reception in the evening at the Salon de la Lumière in the former church of St. Philibert, where M. Parent described the church itself and its history. M. André Fleury gave a recital on an electronic organ and an eloquent address was given by the Abbé Jean Sender on Light and Religious Art, a discourse partly artistic and partly religious, accompanied by the choir of the Chanteurs du Vin de France, whose beautiful singing was a delight.

The closing session took place on Saturday, followed by an official luncheon of the Association, and in the evening by a dinner by candlelight.

The Association is to be congratulated on a most interesting and successful congress, well organised and carried through, with a series of interesting papers and outdoor demonstrations of high standard which made the occasion most worth while. These annual meetings have achieved a stature which makes them an event in the world of lighting, and we look forward with interest to their continuance.

C. & G. Examination Results

The results of the City and Guilds of London Institute examinations in illuminating engineering which were held earlier this year, are given below:—

INTERMEDIATE GRADE

First Class.—H. W. Archer, M. L. Benson, F. H. W. Brightwell, W. R. Gibbon, Miss W. M. Godfrey, D. H. Holloway, J. Horswill, N. Man-Siu Kwong, H. F. McKinlay, G. V. McNeill, C. R. Mortimer, G. C. Smith.

Second Class.—Miss E. P. Benn, J. K. Brain, R. E. Cavalier, T. B. Coles, D. Eacott, D. O. Fern, A. Goonasekera, R. Hart, R. J. Hobson, A. A. J. Maidman, D. Nichol, H. T. Norris, J. F. Norwood, J. F. Parks, S. Pearson, D. A. Rickson, W. Roberts, D. C. S. Rowe.

FINAL GRADE

(*Papers* 1 *and* 2)

First Class.—W. R. Bradshaw, E. S. Brazington, A. J. Dickinson, R. W. France, A. T. Harvey, P. E. R. Keen, J. Lindsay, A. G. Wingrove.

Second Class.—J. Brooks, A. G. Brown, D. Clark, S. A. Doo, H. Singh, K. D. Weguelin.

(*Papers* 1 *and* 3)

First Class.—M. D. Bowl, J. Brooks, J. S. Drummond, A. T. Harvey, P. E. R. Keen, J. Lindsay, G. I. Smith.

Second Class.—F. E. Ayers, C. S. Bayliffe, E. S. Brazington, R. F. Cabuche, G. W. F. Clarke, F. J. Cleaver, C. L. Harper, P. T. Hookway, C. T. Inch, M. G. A. Jackson, G. N. E. Joyce, A. B. Knutton, D. C. McKellar, W. A. P. Noble, H. Singh, C. S. Stockton.

Coronation Illuminations in Hong Kong

By A. F. MAY, Assoc. I.E.E.

Hong Kong by night has always been considered a scene unsurpassed by any of similar nature throughout the world. The author Han Suyin, in her "Many Splendoured Thing," likened the view to a jeweller's window with precious stones of every size and colour glinting on a ground of black velvet and she based her remarks upon her observation made in normal times but, during the twelve days in celebration of the Coronation, this Crown Jewel of the Orient shone with more brilliance than ever before to the glory of Her Majesty Queen Elizabeth.

The view from Victoria Peak on Hong Kong island over the harbour and the peninsula of Kowloon on the mainland and from Kowloon towards the Peak and from almost any point in any direction was one which will never be forgotten by those who had the good fortune to see it. It was a scene unparalleled in the entire Commonwealth.

The waterfronts on both sides of the harbour were ablaze with vari-coloured lights —crowns with lights depicting diamonds, sapphires, rubies and emeralds mounted above the Royal Cipher shone from the rooftops and sides of hundreds of the Colony's buildings, many of which in addition were outlined in fairy lights and further enhanced by floodlighting, illuminated Union Jacks and "Long Live the Queen" outlined in neon lights added to the magnificent scene. Warships in the harbour were outlined in lights and many of the Merchant Marine ships were decorated with strings of lights from bow to stern and from mast to mast. The

warships also gave a really wonderful rocket display for two nights running.

Chinese and foreign business houses, hospitals, schools, hotels, Kaifongs and welfare organisations all combined with Government to make the display and turn the Colony into a magnificent fairyland—no photograph, however good, will be able to do justice to the full brilliance of Coronation Hong Kong.

On either side of the harbour the display was centred on fountains erected by Government—fountains which sprayed red, white and blue water with ever changing colours.

The fountain in Victoria Statue Square was topped by a crown with "Long Live the Queen" in neon lights below; then came a globe of the world from which floodlit flags of the Commonwealth were hung. Four golden lions guarded the fountain and four braziers with "unquenchable" flames were burning night and day. Red and yellow banners mounted on standards topped by golden crowns and floodlit lined the four roads leading from the fountain.

The four fountains at the concourse of the Kowloon and Canton railway station on the mainland also presented a commanding sight. The larger one was decorated with two "ribbons" of red, white and blue "Atlas" fluorescent tubes, and a brazier, similiar to those in Statue Square but larger, topped the standard upon which the ribbons were mounted. Purple and gold pennants mounted upon crown-topped standards surrounded the garden in which the fountains were set, these were floodlit as also were the red, white and blue flowers in the surrounding garden.

All the important Government buildings were decorated with shields and royal emblems and were either floodlit or outlined in fairy lights.

Government House, with its tower and turrets and oriental roof with upturned corners, presented a picture of ancient Cathay with floodlighting giving the impression that the walls were translucent and illuminated from within, making the "Castle" stand out majestically amongst bejewelled trees set in a dark background upon a spur of Victoria Peak.

The General Post Office was picked out with fairy lights on the three visible sides and the emblems of flags of the Commonwealth mounted behind shields which

Fig. 2. The Hong Kong and Shanghai Bank as viewed from Statue Square, with the Supreme Court on the left and the Bank of China in the centre.

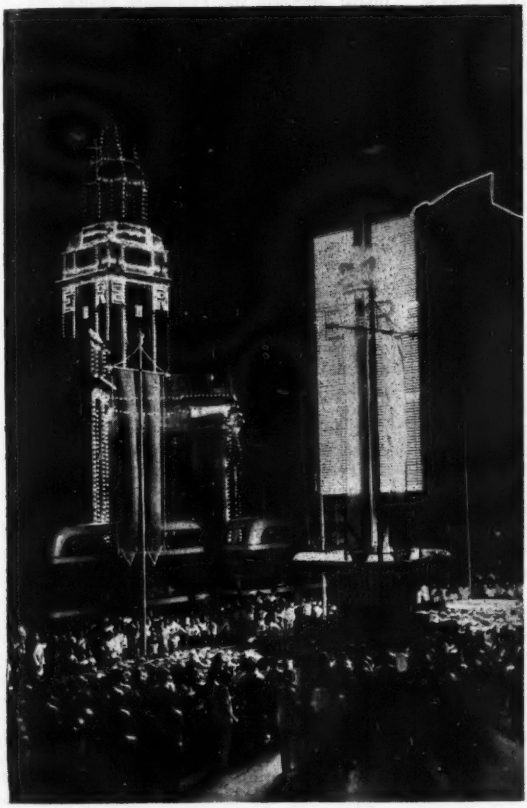


Fig. 3. The Kowloon Canton Railway Station concourse with the illuminated fountain in the foreground.

decorated the building were illuminated by spot lights. It also displayed "Long live the Queen" in neon lights.

The Marine Office and the Central Fire Brigade building were also outlined in fairy lights and had emblems illuminated by spot lights. The Kowloon and Canton railway station, Marine Police headquarters in Kowloon and the Kowloon Magistracy were similarly illuminated.

The Supreme Court, with its imposing granite columns and the other buildings of Colonial type which border Statue Square, including the Hong Kong Club, were illuminated by floodlights, and towering above them all was the Hong Kong and Shanghai Bank, which was picked out in fairy lights and partly floodlit to accentuate the outlining. Upon the roof of this magnificent building there was a $25,000 "bejewelled" crown and E.II.R of huge proportions visible from across the harbour in Kowloon and also from the Peak; these two features contained 3,000 "Atlas" pigmy lamps and 2,600 "Atlas" 15-watt lamps.

A massive pailau, or triumphal arch, 110 ft. high and 80 ft. across was erected by Government at the junction of Nathan Road and Gascoigne Road, Kowloon; it was decorated with oriental carvings and lights. Two 10-ft. drawings of the Queen were erected, one on each side of the pailau and beneath each of these there was a massive cipher in gold. Other pailaus of similar pattern were erected by various welfare associations and Kaifongs. All the main villages in the new territories also had pailaus, there being a total of 21 all told.

The Royal Navy produced as good a showing on land as they did on their warships

in the harbour. Their barracks, H.M.S. Tamar, had the letters E.R., which covered one-third of the wall area on the face of the main building. This building was also outlined in fairy lights with spot lights showing up the flags of the Dominions. The Royal Naval Yard was similarly adorned but with the addition of the Royal Coat of Arms and a variety of naval flags, and the whole was floodlit. On the side facing the harbour the E.II.R. and Crown could be clearly seen two miles away.

The Merchant Navy Club had an illuminated E.R. and Crown feature with flags and red, white and blue fairy lights. The Army Flag Staff House, G.O.C.'s residence, and the dome of La Salle College, which is in use as the Thirty-third General Hospital in Kowloon, were floodlit. The main entrances to the N.A.A.F.I. clubs, both on Hong Kong and Kowloon sides, were similarly illuminated, and the warrant officers and sergeants' mess at Victoria Barracks was picked out with multi-coloured lights.

An illuminated 'bus and an illuminated tram plied back and forth carrying no passengers but presenting a very brilliant spectacle. A Peak tram, which is hauled up Victoria Peak by a cable and counterbalanced by another tram, was outlined in fairy lights and the road bridges over the railway and stations were similarly treated. All the ferries of the Star Ferry Co. and the Yaumati Ferry Co., and their respective piers on both sides of the harbour, were outlined in fairy lights.

All the main business premises in the Colony, too numerous to name individually, were illuminated, but outstanding amongst them was the Jardine Engineering Corporation, Ltd.; this company had, in addition to the usual outlining of the building in fairy lights and emblems, a fluorescent thistle illuminated with ultra violet light. The Chartered Bank incorporated the tri-colour fluorescent "ribbons," the Bank of China was partly illuminated from the spill-over of light from the floodlights on the Supreme Court and the Hong Kong and Shanghai Bank, but its three doorways were decorated in traditional style with huge red lanterns. Shell House was decorated and illuminated by colour-changing floodlights. The Hong Kong Electric Company's power station was floodlit with sodium lights, and the China Light and Power Company also floodlit their power station, and the glass tower on their offices was illuminated from within in red, white and blue. J. D. Hutchinson and Co. had 100-ft.-square double crowns back to back on their poster board opposite the Peninsula Hotel, which was floodlit. Telephone House, which is 14 storeys high, was similarly equipped and, in addition, upon the roof of this modern building there was a massive "fountain" in red, white and blue fairy lights.

The illuminations were not confined to the European business premises. The four big Chinese department stores—the Sincere Co., the Sun Co., the Wing On Co., and the China Emporium outlined their seven-storey buildings in fairy lights and Chinese lanterns, and each company had a special show window in which a large portrait of the Queen was placed against an appropriate background. Hundreds of other Chinese business houses were similarly illuminated, even Sin Hoi, a lampshade seller in an open-air stall on Battery Path, illuminated a photograph of the Queen and decorated his "shop."

St. John's Cathedral was floodlit, and many other churches were illuminated, including St. Teresa's Church in Kowloon.

Shop window displays in particular showed ingenuity, and with few exceptions the shops in the centre of Victoria and in Nathan Road, Kowloon, had cleared their windows of saleable goods and devoted the entire space to Coronation decorations. The most outstanding was the small display in the window of Sennet Freres, who contrived a crown from diamonds and pearls on a background of black velvet. This display was symbolic of the whole of Hong Kong, which, with its Coronation illuminations added to the usual fairyland of lights, did indeed resemble a jewellers' window. Most of the decorations and lighting fittings were supplied by the General Electric Company, Limited and Thorn Electrical Industries. The Jardine Engineering Company and the local branch of the General Electric Company, Limited, were responsible for the installations on many of the important buildings, including Government buildings. Much of the work, however, was carried out by the local contractors.

"Lighting to Measure"

A "Lighting to Measure" exhibition, arranged by the B.T.H. Co., Ltd., is being held in the Mansard Gallery at Heal's, in Tottenham Court Road, and will be open until October 24. The exhibition consists of a number of furnished rooms with lighting arranged in accordance with the suggestions given in a booklet recently published by the B.T.H. Co., Ltd.

A Colour Matching Unit

By Dipl. Ing. J. HOFFMAN

A description of a new colour-matching unit which uses a high-pressure Xenon lamp as the light source.

An excellent colour matching apparatus, known as the "Colortest" Lighting Unit, has recently been developed by the firm of Dr.-Ing Schneider and Co., of Frankfurt.

Colour matching is a most important and critical matter in a number of industries, including those connected with textiles, paper, leather, chemicals, etc. Accurate colour rendering is required for various reasons, including (i) the dyeing of fabrics and other materials to match existing samples, (ii) to check current production for colour uniformity and homogeneity, (iii) the examination of new colour compositions, and (iv) the exact recognition of colour effects.

If the individual differences of observers and their physical condition are left out of consideration, the colour stimulus which the human eye receives from a coloured object, illuminated by a certain light, depends on the following: (a) The capacity of the object to reflect the various wavelengths of light, and (b) the spectral composition of the light falling upon the object. Consequently the choice of the right source of light is the deciding factor in accurate colour-evaluation.

Daylight is the normal source for colour matching, whereby either the light of the northern sky is chosen or the average natural daylight, which represents a mixture of sunlight and skylight, and which possesses with the sun at an altitude of 25 deg. a constant spectral distribution.

There is an urgent need for a practical artificial light source of proved reliability for colour matching, and which makes the user independent of the existence of daylight and its fluctuation in respect of intensity and spectral distribution, and which allows colour matching at any time with high luminous intensity.

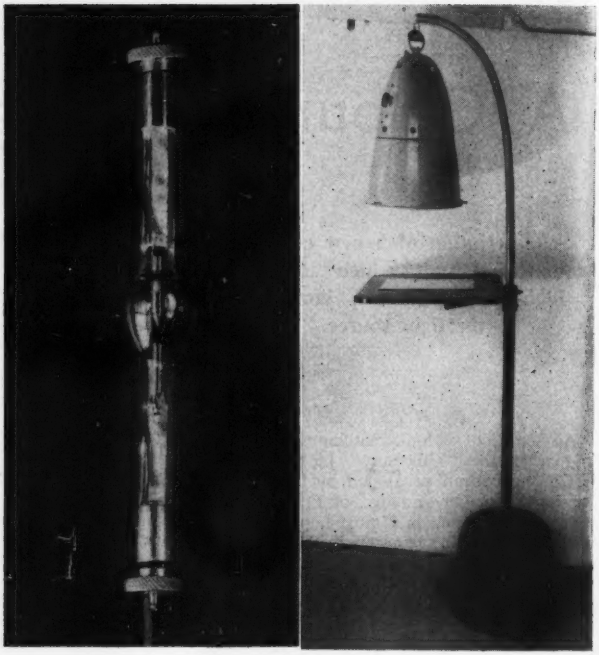
Artificial light sources which have in the past been used for this purpose are (1) the Moorelight, (2) carbon-arc-light, (3) "daylight" globes and "daylight" fluorescent lamps. Frequently experts have made their own colour matching devices by mixing different sources of light, but these provisional measures have the disadvantages of low efficiency of light output, insufficient intensity, and more or less strong deviations from normal daylight. These facts made it impossible to record delicate colour differences, and even resulted at times in the reproduction of wrong colour values.

The DISCO "Colortest" Unit, which is equipped with a Xenon High Pressure Lamp XBO 162, must be regarded as a remarkable progress in the field of colour evaluation. The XBO 162 lamp, as the actual source of light, is in nearly complete conformity with the "average natural daylight" as far as its spectral composition is concerned.

An accurate analysis of the spectral composition of the light from the Xenon lamp gives the following analysis:—

	Blue	Green	Red
Daylight, north, without sun	100	84	62
Table-fixture, incandescent lamp, 40-60-watt	100	140	309
Fluorescent lamp (Philips "warmtone")	100	124	110
Fluorescent lamp (Philips white)	100	86	52
"Colortest" with Xenon-lamp XBO 162	100	83	60

These figures demonstrate that the Xenon-



The Xenon XBO 162 lamp and, right, the complete "Colortest" unit

light is thus the best source of artificial daylight at present available.

The most important electrical characteristics of the lamp are:—

Lamp watts	160 w.
Circuit voltage	220 v. A.C.
Luminous flux	3,200 lm.
Candle power	330 cd.
Efficiency of light evolution	20 lm./w.

The lamp is cooled by the surrounding air.

For striking the lamp requires a high-tension striking device, whilst for stabilisation of the discharge during operation a special ballast is provided. On striking the lamp produces immediately the full luminous flux in the correct spectral composition. The spectrum is practically continuous in the visible range, and independent of fluctuations in supply voltage.

The life of the lamp, which on an average amounts to 300 operating hours, is in no way influenced by the frequency of starting. The "Colortest" unit consists of an aluminium reflector, the inside of which is white stove-enamelled. The Xenon lamp is installed in upright position at the focus of the reflector. The upper portion of the aluminium housing contains the high-tension striking device, whilst the striking contact and a turning switch are installed on the outside for convenient handling. The ballast is housed separately in a special box.

The reflector should preferably be closed by a special light diffusing cover glass which allows a sufficient amount of u.v.-rays to pass, and prevents the operator being troubled by the smell of ozone developed by the light source.

The cost of running the lamp is approximately 1 DM, and it is therefore advisable to operate the unit only during the actual procedure of colour matching. To facilitate this operation the unit can be supplied with a pedal switch which serves as circuit-breaker as soon as the operator releases it.

The "Colortest" unit is intended to be mounted 0.5 m. above the working table, whereby a luminous intensity of approximately 1,500 lux is obtained. The unit is designed for operation on 220 v. A.C.

New Lighting Installations

On Wednesday, June 24, British Railways opened in the West End of London a new Booking and Information Office to be known as the "British Railways Travel Centre." This is located at the corner of Lower Regent Street and Carlton Street (just off Piccadilly Circus).

The whole of the side in Carlton Street,

and much of the Regent Street side, is windowed, to show the interior which is air-conditioned and brilliantly lit. There is ample counter space and comfortable seating.

The main public area has an illuminated louvred ceiling lighted by fluorescent units above. The surrounding areas have acoustic plaster ceilings with tungsten lights spaced in a regular pattern. These give a slightly lower intensity of lighting, and the eye of the passer-by is drawn to the central area where the ticket and reservation counters are situated.

The comparatively narrow frontage to Regent Street has been made to look wider by bringing out the ceiling with its pattern of light fittings to the edge of the fascia and keeping to the minimum any obstruction of the view by piers and walls.

The tungsten lighting fittings, supplied by Messrs. Falk, Stadelmann and Co., Ltd., combine some features of a standard "Falks" contemporary design fitting with special features required by the architect. The reflector is arranged with a fixing bezel and the upper portion of the spinning finishes half-way between the first and second step of the glass unit. Each fitting accommodates a 150-watt lamp and provides a 45 deg. cut-off from the downward vertical.

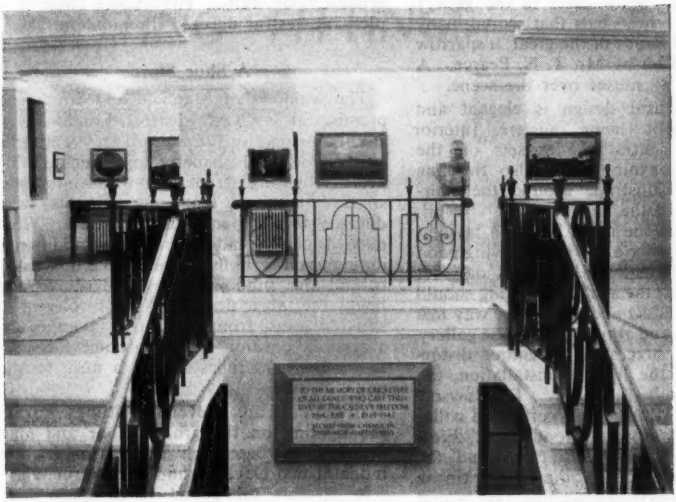
The lamp and fittings used above the louvred ceiling were of 2 ft., 4 ft. and 5 ft. sizes and were supplied by the B.T.H. Co., Ltd. and Falk, Stadelmann and Co., Ltd. The lamps are mounted 1½ ft. above the louvring in continuous rows of 2½ ft. to 3 ft. apart. The louvred ceiling is only 8 ft. above floor level, but creates the illusion of height. Viewed from the street the fluorescent lighted area has a most attractive appearance. The illumination on the working plane is in the region of 45 lm./ft.². By the use of pattern switches it is possible to reduce the level of illumination to 22 lm./ft.² without in any way imparing the evenness of intensity.

The Travel Centre was designed and carried out under the direction of the architect to the Railway Executive, Dr. F. F. C. Curtis, A.R.I.B.A.

New Rolls-Royce Factory

Approximately 600 Ediswan four-tube cold cathode lighting fittings have recently been installed in the new factory of Rolls-Royce Ltd., East Kilbride, Scotland. The fittings are mounted at a height of 17 ft. above the floor and at a spacing of 10 ft. by 11 ft.; the resultant average illumination value being 40 lm./ft.². The consulting engineers for this installation were Donald Smith, Seymour and Rooley, 204, West Regent-street, Glasgow, C.2, and the installation work was carried out by James Kilpatrick and Sons, Ltd., Kelvin House, River Cart Walk, Paisley.

Cold-cathode installation at Rolls-Royce.

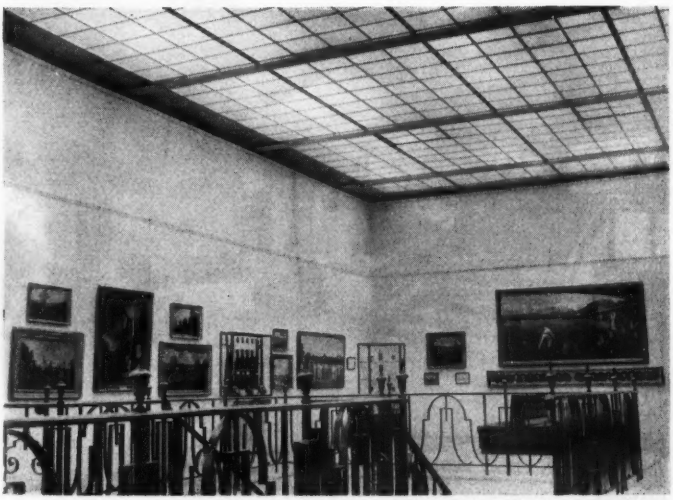


The small gallery at the Imperial Cricket Memorial.

The M.C.C. Memorial Gallery

Dedicated "To the memory of cricketers of all lands who gave their lives in the cause of freedom" during the two world wars, The Imperial Cricket Memorial at Lord's Cricket Ground was opened earlier this year by H.R.H. the Duke of Edinburgh. Built inside a disused racket court behind the pavilion, the architect, John H. Markham, F.R.I.B.A., designed the Memorial Gallery which now contains a unique and fascinating collection of paintings and relics of men and events significant in the history of cricket.

Facing the entrance on the ground floor, a broad staircase rises to a half landing from which two reverse staircases lead off left and right to the main gallery with a smaller gallery at one end. On the walls are hung



The Main Hall of the Memorial Gallery at Lord's.

many paintings. Show cases in the gallery hold historical relics—bats that scored many a century in the hands of the great; a sparrow killed by a ball hit by Mr. T. N. Pearce. A bust of "W. G." muses over the scene.

The architectural design is elegant and dignified without being austere. Interior decoration in neutral shades sets off the colours of the exhibits and also the fine wrought iron balustrade around the staircases and well of the hall.

The ceiling of the main hall is a laylight 60 ft. by 30 ft. under a glass roof giving good gallery lighting on a really bright day. It was essential that the artificial lighting should give a daylight effect and not in any way mar the appearance and atmosphere of the gallery, and avoid any suggestion of colour distortion. To plan the lighting installation, the architects consulted Mr. W. E. Rawson-Bottom of the Ministry of Works and collaborated with Thorn and Hoddle Ltd., Electrical Engineers and Contractors, and the lighting engineers of Crompton Parkinson Limited, to develop the scheme that would give exactly the right effect. The main lighting is provided by 32 Crompton closed-top two-lamp, instant start fittings with "Daylight" tubes, mounted above the lay-light. In the gallery annexe there are five Crompton "Alton" "Perspex" trough single-lamp fittings with "Daylight" tubes. In addition, concealed fluorescent lighting by "Daylight" tubes is installed in the cornice around the ground floor walls. The overall effect is a pleasant, restful diffused illumination.

A Shoe Store

The windows of Manfield and Sons' new premises at 319, Oxford-street, London, W.1, are illuminated by 5 ft. 80-watt Daylight tubes above louverall panels supplemented by accent lighting from 150-watt internally silvered tungsten filament spotlights with diffusers flush mounted in the panels. Windows displaying ladies' shoes have additional illumination from fluorescent tubes concealed behind the window ledges and above and below the fabric drapes. All control gear is situated away from the tubes in an easily accessible position. The entrance lobby is lit by Daylight tubes behind a flush louvre panel.

In the sales areas seventeen fittings provide the lighting on the ground floor and nine fittings in the basement. Each fitting accommodates two Daylight and one Warm White 5 ft. 80-watt tubes and is complete with "Quickstart" control gear. Concealed fluorescent tubes are used for lighting recessed displays on the stairways while wall displays in the sales areas are spotlighted by 150-watt internally silvered lamps and reflectors.

The shopfitting and display work was constructed and installed by E. Pollard and Co., Ltd., with electrical fittings supplied by Thorn Electrical Industries Ltd.

Interior of shoe shop in Oxford Street.

LIGHTING FITTINGS

No. 2.

Pendant fitting P.33 with 8M shade. Suspension length 2 ft. 6 in. Diameter of each shade 8 in. Metal parts as above. Available also with 8MB shades (metal and buckram) or 9B shades (all buckram). Maximum recommended size of lamps, 3 x 150 watts.
Price, £11 6s. 8d. (P.T. £2 2s. 6d.)
ALLOM BROS., LTD.

Wall bracket B.13 with 8MB shade. Metal parts available in ivory, ivory and wedgewood blue or ivory and pale green. Buckram shade in stone white. Two other shades of approximately the same size are also available for use with this fitting which may be inverted. Maximum size of lamp, 150 watts.
Price, £4 5s. 4d. (P.T. 16s. 6d.).
ALLOM BROS., LTD.

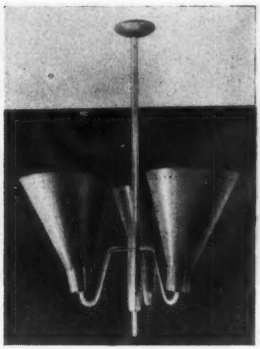
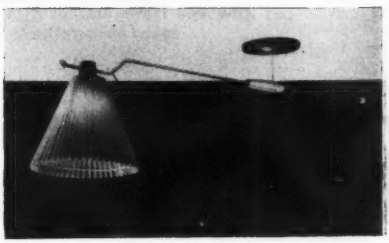
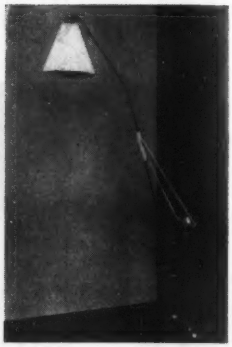


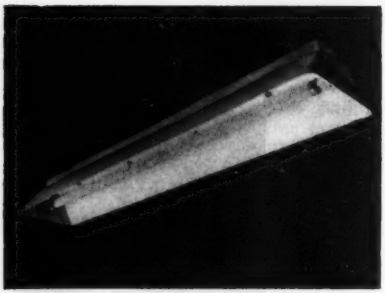
Table standard T.24 with 18B shade. Overall height 2 ft. 6 in. The height of the lamps can be varied by the adjustable sleeve on the stem. Shade in buckram, diameter 18 in. Maximum recommended size of lamps, 2 x 100 watts.
Price, £9 5s. 4d. (P.T. £2 1s. 3d.)
ALLOM BROS., LTD.



Pendant fitting R.16 with shade 12B. Suspension length 19 in. Diameter of shade 12 in. Maximum size of lamp, 200 watts. Fitting can be turned through 360 deg. (with stop to prevent continuous turning). Position of lamp can be adjusted along the horizontal arm.
Price, £7 15s. 4d. (P.T. £1 15s. 3d.)
ALLOM BROS., LTD.



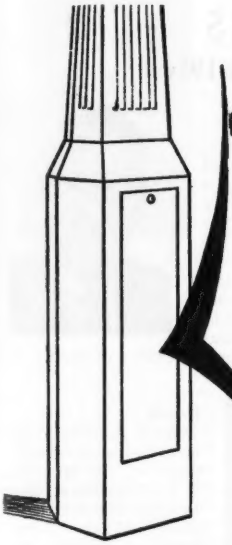
Wall standard W.15 with shade 12B. Maximum height, 5 ft. 8 in. Diameter of shade, 12 in. The distance of the lamp from the wall can be varied by the adjustable sleeve on the stem. Maximum recommended size of lamp, 200 watts.
Price, £10 19s. 4d. (P.T. £2 7s. 3d.)
ALLOM BROS., LTD.



All-plastic fitting available for 4-ft. and 5-ft., single or twin, fluorescent lamps. Made of laminated Rigid P.V.C., grey on outside, white on the reflecting surface. Unaffected by damp or corrosive atmospheres.
Price (4 ft. single), £7 18s.
NEW ERA INDUSTRIES (TOTTENHAM), LTD.

Flameproof handlamp (Buxton Certified) for use in dangerous atmospheres constructed of aluminium alloy with type "A" well glasses and stout galvanised wire guard. Handle designed so that lamp can be hung. Finished in grey enamel. Suitable for voltages up to 250. Lamp 40/60 watts. Weight 8 lb.
Price, £5 18s.
SIMPLEX ELECTRIC, LTD.

Decorative fitting ("Alton") for one 5-ft. fluorescent lamp. Diffuser of light opal white "Perspex"; metalwork corrosion resisting and heavily stove enamelled lustrous white. Intended for ceiling mounting but may be suspended. The fitting is completely wired ready for connection.
Price, £10 16s. (P.T. £1 8s. 2d.).
CROMPTON PARKINSON, LTD.



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I.E.S. ACTIVITIES

Regional Chairmen—Session 1953-1954

Bath and Bristol

Mr. R. W. Steel, M.I.E.E., is manager for the Bath District of the South Western Electricity Board. Before nationalisation he was electrical engineer and manager at Cheltenham. He has served on the Council of E.D.A. and of the E.R.A., and was Chairman of the Gloucester and Cheltenham Group in 1946. He presented a paper on "Side Street Lighting" to the A.P.L.E. in 1947.

Birmingham

Mr. Howard Long, M.I.E.E., F.I.E.S., (Hon. Member), joined Holophane Ltd. in 1922. The following year he went to the Metropolitan-Vickers Electrical Co. Ltd., and in 1929 joined the Benjamin Electric Ltd. He has served on the I.E.S. Council and was a vice-president. He was the first chairman of the Birmingham Centre.

Cardiff

Mr. W. E. James is manager of the Cardiff branch of the Revo Electric Co. Ltd., and has been with that company for nearly 30 years. He is a founder member of the Cardiff Centre.

Glasgow

Mr. W. L. Quinn is District Lighting Engineer with the Edison Swan Electric Co. Ltd., Glasgow. He joined the company in 1948 when Harcourts were incorporated in the Ediswan organisation. Previous to this he was lighting sales engineer for Scotland and Northern Ireland with Harcourts.

Gloucester and Cheltenham

Mr. M. C. Hughes, who is a Registered Lighting Engineer, is with Newey & Eyre Ltd., Cheltenham. For six years he was in the I.E. Department of Ekco-Ensign Electric Ltd., and previously was with the G.E.C. in Cardiff and Gloucester. He has been a member of the I.E.S. for 16 years.

Leeds

Mr. L. A. Doxey commenced his career as a pupil of the late Mr. T. P. Wilmshurst, then Borough Electrical Engineer of Derby. From 1924 he served the department as Street Lighting Engineer, being appointed Public Lighting Superintendent in 1936. Appointed City Lighting Engineer, Leeds, in 1946.

Leicester

Mr. G. Stephens saw service with the R.N.V.R. during the first world war, and on demobilisation joined the Midland Dynamo Co. Ltd., where he was employed in the commercial side for 26 years. In 1945 he was appointed to his present position as manager of the Leicester Depot of E. A. Wood Ltd.

Liverpool

Mr. W. Gilchrist, A.M.I.E.E., was educated in Scotland. He served an apprenticeship with Yarrow & Co. Ltd., Engineers and Shipbuilders, Glasgow. He joined the Central London Electricity Ltd. in 1936 and he was appointed Chief Commercial Officer of M.A.N.W.E.B. in 1948.

Manchester

Mr. J. S. Smythe, B.SC., A.M.I.E.E., F.I.E.S. was trained at the Faraday House College. In 1935 he joined the team of lighting engineers led by the late G. H. Wilson at the Research Laboratories of the G.E.C. Ltd. He has served on the I.E.S. Council and on various B.S. Committees. After the war he became Chief Lighting Engineer for the N.W. Area of the G.E.C. Ltd.

Huddersfield

Mr. J. T. Thornton was apprenticed to the electrical contracting industry and subsequently became departmental manager to a firm of electrical contractors. In 1930 he became managing director of the Venus Electrical Co. Ltd., and he holds the same position today. He was a founder member of the Huddersfield Group.

Newcastle-on-Tyne

Mr. C. C. Veitch, B.SC., F.I.E.S., joined the G.E.C. Ltd. in London in 1931 after graduating for Durham University. In 1933 he joined the Newcastle branch and was transferred to Hull in 1937. After the war he returned to Hull in charge of the Fittings and I.E. Department and went to Newcastle as manager of the Lighting Fittings Department in 1949. He is a Registered Lighting Engineer.

North Lancashire

Mr. J. A. Prowse, A.M.I.E.E., F.I.E.S., served his apprenticeship with Artic Fuse and Electrical Manufacturing Co. Ltd. In 1926 he joined the North Eastern Electric Supply Co. Ltd., and in 1937 joined E.D.A. in London as technical officer concerned with lighting and rural electrification. In 1950 he joined the North Western Electricity Board as domestic and commercial development engineer.

Nottingham

Mr. Norman C. Slater is General Manager for the Contracts Section of W. J. Furse & Co. Ltd., Nottingham. He gained his early training with the Yorkshire Electric Power Company with whom he was employed for some 12 years. He has been a member of the Nottingham Centre many years.

Stoke-on-Trent

Mr. R. S. Riddell is very well known in Stoke-on-Trent, where he has been manager of the B.T.H. Co. Ltd.'s branch since 1933. He is a native of Newcastle-on-Tyne, where he received his education and technical training, after which he joined the B.T.H. Co. Ltd. in Birmingham in 1922 as their representative on lamps and wiring supplies in the Midlands.

Bradford

Mr. Harry Moss, M.I.E.E., F.I.E.S., has been connected with the contracting side of industry since 1899. He was a manager in business on his own account in 1909 and he retired in 1940. He has held various offices in E.C.A. during a period of 30 years. He is a member of the E.C.A. Council, and now at 74 is still going strong.

Tees-side

Mr. W. J. Miller commenced his career with Falk, Stadelmann & Co. Ltd. in 1924, and has had over 29 years of unbroken service with this company. He has represented them in London, Midlands and Tees-side, where he now resides and takes an active interest in the affairs of the Group.

Forthcoming I.E.S. Meetings.

LONDON

October 13th

Sessional Meeting. Presidential Address by W. R. Stevens. (At the Royal Institution, Albemarle Street, W.1.) 6 p.m.

CENTRES AND GROUPS

October 1st

CARDIFF.—"Electric Discharge Lamps for Plant Irradiation," by J. J. French. (At the South Wales Electricity Board's Demonstration Theatre, The Hayes, Cardiff.) 5.45 p.m.

GLASGOW.—"Blended Light," by A. Anderson. (At the Institute of Engineers and Shipbuilders in Scotland, 39, Elmbank Crescent, Glasgow, C.2.) 6.30 p.m.

NOTTINGHAM.—Chairman's Address, by Norman C. Slater. (At the Police Assembly Hall, Shakespeare Street.) 6 p.m.

October 2nd

BIRMINGHAM.—Chairman's Address, by Howard Long. (At Regent House, St. Phillip's Place, Colmore Row, Birmingham.) 6 p.m.

October 7th

EDINBURGH.—"Seeing and Believing," by R. W. Lawrence. (At the Conference Room, Manor Club, 12, Rothesay Place, Edinburgh, 3.) 7 p.m.

NEWCASTLE.—Chairman's Address, by C. C. Veitch. (At Roadway House, 8, Oxford Street, Newcastle-on-Tyne, 1.) 6.15 p.m.

SWANSEA.—Chairman's Address, by F. M. Macpherson. (At the Plaza Buildings, The Kingsway, Swansea.) 6.30 p.m.

October 8th

LEEDS.—Supper Dance. (At the Astoria Ballroom, Leeds.)

MANCHESTER.—Symposium on "Lighting for Sport." (At the Demonstration Theatre of the North Western Electricity Board, Town Hall Extension, Manchester.) 6 p.m.

BRADFORD.—"Lighting Problems in Industrial Photography," by R. Baron. (At the Offices of the Yorkshire Electricity Board, Bradford No. 1 Sub-Area, 45–53, Sunbridge Road, Bradford.) 7.30 p.m.

October 12th

SHEFFIELD.—Chairman's Address, by J. Dean. (At the Medical Library, The University, Western Bank, Sheffield, 10.) 6.30 p.m.

October 13th

STOKE-ON-TRENT.—"Applications of Flash Discharge Tubes." Joint meeting with the North Staffordshire Photographic Society. (At the Lecture Hall of the Midlands Electricity Board, 31, Kingsway, Stoke-on-Trent. 6 p.m.

October 14th

HUDDERSFIELD.—"The Use of Light in Horticulture," by J. J. French. (At the Yorkshire Electricity Board's Showrooms, Market Street, Huddersfield.) 7.30 p.m.

October 15th

GLOUCESTER AND CHELTENHAM.—Annual Dinner. (At the Belle Vue Hotel, Cheltenham.)

October 20th

LIVERPOOL.—Chairman's Address. "The Economics of Lighting," by W. Gilchrist. (At the Merseyside and North Wales Electricity Board's Service Centre Lecture Theatre, Whitechapel, Liverpool.) 6 p.m.

October 21st

NORTH LANCASHIRE.—Presidential Address, by W. R. Stevens. (At the Demonstration Theatre of the North Western Electricity Board, 19, Friargate, Preston.) 7.15 p.m.

TEES-SIDE.—"Shipyard Lighting," by J. S. McCulloch. (At the Cleveland Scientific and Technical Institution, Corporation Road, Middlesbrough.) 6.30 p.m.

October 23rd

BATH AND BRISTOL.—"The Development of the Tungsten Filament Lamps," by B. P. Dudding. (At the South Western Electricity Board, Lecture Theatre, Colston Avenue, Bristol.) 6.15 p.m.

October 26th

LEEDS.—"The Work of a Street Lighting Department," by L. A. Doxey. (At the Lecture Theatre of the Lighting Service Bureau, 24, Aire Street, Leeds, 1.) 6.15 p.m.

LEICESTER.—"Sodium Lamps—their application at home and abroad," by J. J. French. (At the Demonstration Theatre of the East Midlands Electricity Board, Charles Street, Leicester.) 7 p.m.

October 28th

BIRMINGHAM.—"Progress in Illuminating Engineering," by R. O. Ackerley. (At the Wine Lodge Hotel, The Burges, Coventry.) 6 p.m.

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Correspondence

Illumination Trends

To the Editor, LIGHT AND LIGHTING.

Dear Sir.—Mr. Horniblow's letter on "Illumination Trends," which appeared in *Light and Lighting* last March, whilst dealing with, to quote, "a well of vast dimensions," brushes aside as "first steps" that which to my mind is of primary importance, i.e., *design*.

Being naturally lazy, I sat back and waited for the screams, but none apparently were forthcoming. A complete scheme involving all the sciences mentioned may be a complete failure if man's aesthetic needs are not satisfied. The human eye, with its amazing powers of accommodation, is relatively easily satisfied, but let the design pattern be unpleasing then even the most unlearned will complain.

Little use saying that the furnishing, decoration and lighting are scientifically correct. No, Sir, let us have lighting designers with science assisting and pro-

viding only the materials from which the artist creates.

To Mr. Hemingway I would but say that sales are dependent on service, and he who can assist his customers to the nth degree gets the best results in terms of turnover.

My own company specialise in industrial lighting equipment, but I have found that the biggest orders are often forthcoming from those who know that Mr. X is always available to help out on any aspect of the job.—Yours faithfully,

Birmingham. C. BOSWORTH.

To the Editor, LIGHT AND LIGHTING.

Dear Sir,—I have only just received the May issue of *Light and Lighting* as I am several thousands of miles away.

I was very interested to read Mr. Hemingway's remarks and do most wholeheartedly agree with the sentiments he has expressed. For many years I have felt at times embarrassed by commercial ties. There have been slight differences between loyalty to the firm that has hitherto employed me and what I have felt to be the real interests of the firm that I have advised. Like your correspondent also I have found myself involved in interior finishes, and often I have found structural modifications desirable.

I have now taken "the bull by the horns" and started in practice on my own. I am finding it a genuine relief to be in a position to give my clients what I know to be sound advice on a subject that embraces primarily illumination, but also involves, what I am calling for want of a better word, "décor," together with pure functionalism. I am also finding that my clients are more willing to take my advice and permit me to develop my ideas. Hitherto, there was suspicion that I had other reasons for advising on a specific point in a certain way.

I would not like to suggest that the practice of firms marketing lighting fittings and employing lighting engineers should be abandoned. It is obvious that when all other things are equal, the organisation employing the better-trained personnel will succeed. It is, however, possible that one engineer employed by a lighting firm can do more and more useful work when in contact with a lighting consultant, thus saving valuable time.

The arguments for and against the existence of a lighting consultant, whose fees must be borne by the consumer, would be interesting to hear.—Yours faithfully,

Johannesburg. J. V. SILVERSTON.

SITUATIONS VACANT

Home Counties Lighting Fittings Makers require JUNIOR ENGINEER able prepare schemes — advise on fittings — estimate prices and prepare quotations. Knowledge of materials buying an advantage. Also JUNIOR DRAUGHTSMAN familiar fittings construction. Write, giving age, experience and salary required.—Box 852.

Assistants are required by THE BENJAMIN ELECTRIC LTD., Brantwood-road, Tottenham, N.17, in their Engineering and Research Department. Applicants should preferably be 25/30 years of age with education to Higher National Standard. Experience in one or more of the following categories especially useful:—

(a) Physics or Electronics—for problems associated with gear for discharge lamps.
(b) Electrical Engineering—for investigation of electrical, optical and thermal properties of Lighting Fittings.
(c) Mechanical Engineering and Manufacturing Processes—for the design of Lighting Fittings.

Apply by letter, giving full details of age, training and experience, with salary required, for attention of Chief Technical Engineer.

COLOUR TRIANGLE—FREE. A small number of extra copies of the full-colour plate in Bouma's "Physical Aspects of Colour" is available free to engineers and physicists. Send stamped addressed envelope 10¾ in. x 7 in. to Philips Technical Library Dept., Cleaver-Hume Press, 42a, South Audley-street, W.1.

A complete set of *Light and Lighting* from January, 1943, to December, 1953, is offered for sale. All copies in good condition. Price £2, plus postage. Inquiries to *Light and Lighting*.

Obituary

W. O. FENWICK.

It is with deep regret that we report the death on August 29 of Mr. W. O. Fenwick, Technical Editor of the *Electrical Review*. Mr. Fenwick was born in Cairo in 1893, and received his technical education at Faraday House. He joined the *Electrical Review* in 1918, and was appointed technical editor in 1948. He was very well known and liked in the lighting industry, and all who came in contact with him had the highest regard for him as a technical journalist.

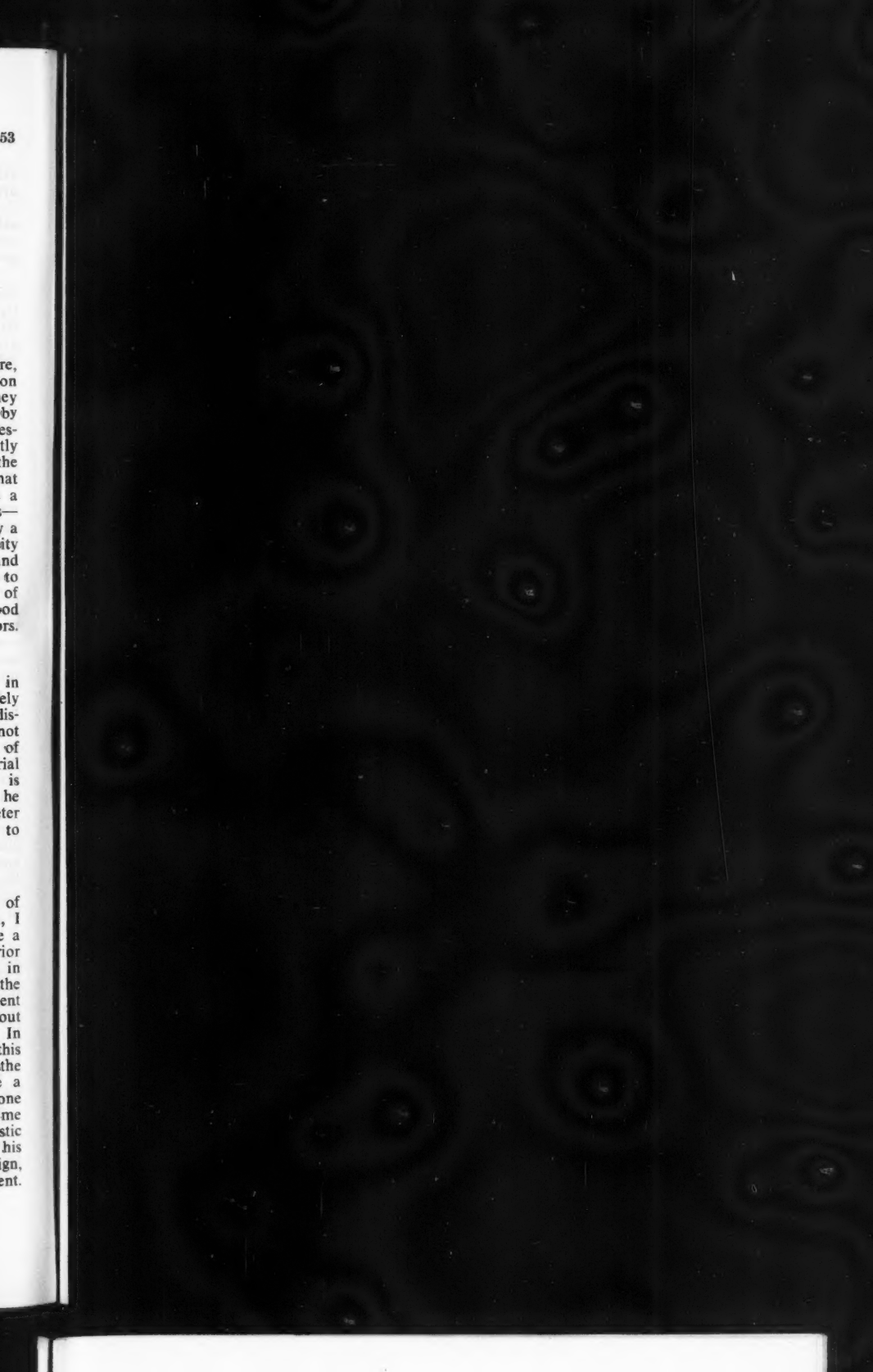
POSTSCRIPT

By "Lumeritas"

Now is the time when bad light stops gardening, as well as certain other outdoor pursuits, which we may have enjoyed during the summer months after the day's work was done. No doubt some of us will be spending more of our leisure time in watching variations of luminance over the base of a glass "bottle," from the size of which our friends may perhaps judge our "income group." But, if any of my readers still view their television displays in a darkened room, and do not find either the dark surrounds or the programmes sufficiently sleep-making, they should get in touch with a well-known furnishing house whose recent advertisement, in a newspaper personal column, enjoins them to "Fall asleep at television with the . . . Leg Rest"!

Recently, I read a user's claim that one of his electric lamps has been in service for 40 years and is still "going strong." As I am subject—like all of us—to the laws of association of ideas, one of the immediate effects of this was to remind me of a certain song, popularised in my long-lost youth by a certain music-hall artist, to the effect that, "We've been together now for 40 years, and it don't seem a day too long." But, to be serious, I do not imagine this is a record performance and, anyway, the actual burning hours of the lamp was not stated. The efficiency of the lamp may now be too low for its retention to be worth while, except as a museum piece, and, while its owner evidently regards it as a cheap lamp, it may be doubted whether he is getting his lumens as cheaply as he would by investing in a new lamp. Incidentally, I understand that the National Federation of Ironmongers is considering placing a low-priced electric lamp on the market. There is no novelty in this, for low-priced lamps have been with us for years and I have certainly bought some myself. As a user, I naturally want good lamps for the lowest possible price, but I cannot claim to have had the same service from the "cheap" lamps I have bought as from those of more reputable brand and higher price.

I wonder if, in the not very distant future, all our recommended values of illumination will be, numerically, much smaller than they are now? This thought is not prompted by any belief that present values are unnecessarily high but by the suggestion, recently put forward in the electrical Press, that the rationalisation of lighting units requires that the unit of luminous flux be defined as a quantity 4π times greater than it now is—that is to say, as the total flux emitted by a uniform source giving a luminous intensity in all directions of one candela. If and when this change is made, we shall have to get used to the idea that an illumination of two or three lumens per square foot is good practice for a great many working interiors.

If "foot-candle" is now "deprecated" in this country the candle itself seems likely to survive. Someone is said to have discovered a new use for it, although it is not a use I can recommend. An Irishman of Hull has recently been committed for trial on a charge of attempted murder. It is alleged that, having told his grandmother he hated her, he disconnected the gas meter and left a lighted candle nearby hoping to produce an explosion.

From the programme I have received of I.E.S. meetings, which begin this month, I am interested to note that there is to be a paper on Flicker in Relation to Interior Lighting, at the March sessional meeting in London. Last month I commented on the subject of flicker in relation to fluorescent lighting, and I hope to learn more about this from the paper I have mentioned. In view of recent correspondence in this journal, I am also interested to note that the Glasgow Centre has arranged to have a discussion on "The Lighting Engineer": one of my correspondents has written me stressing the importance of the artistic aptitude of the lighting engineer in his approach to the problems of lighting design, which he regards as a primary requirement.